Annotation for the 10th week

Erratum: In the Exercise VI(iii), I messed with the numerator and denominator. So, the result of $\lim_{x\to 1_+} g(x)$ is $-\sqrt{3}$ and NOT $-\frac{1}{\sqrt{3}}$. Therefore, the final result is $e^{-\sqrt{3}}$.

In the first half, we will again practice finding limits of (compound) functions. In the second part, we start with derivatives. We focus on two things. First, a simple arithmetics of derivatives which allows us to find derivatives of functions like

$$f(x) = 3x^4 - e^x + 2\arctan x + 7,$$
$$f(x) = x\log x - \frac{1}{x^3},$$
$$f(x) = \frac{\cos x}{x^2 - 4x + 3}.$$

Second, we learn how to differentiate compound functions, e.g.

$$f(x) = (x^2 + 3x)^6,$$
$$f(x) = \sin \sqrt[3]{x^4 + 1},$$
$$f(x) = \log^2(\arctan 5x).$$